Virginia DCR's SWM Regulation Revision Process:

Water Quantity Criteria Work Group

April 22, 2008

Virginia Department of Conservation & Recreation

DCR
Virginia Department of Conservation & Recreation

Regulation Revision Process To Date

- Updating administrative oversight and program administration criteria
- Updating/improving water quality criteria to include addressing Chesapeake Bay nutrient reduction goals for both Nitrogen (TN) and Phosphorus (TP) – new methodology and updated BMP standards
- Update permit fee schedule to reasonably reflect state/local workload involved with administering program (program is entirely funded by user fees)

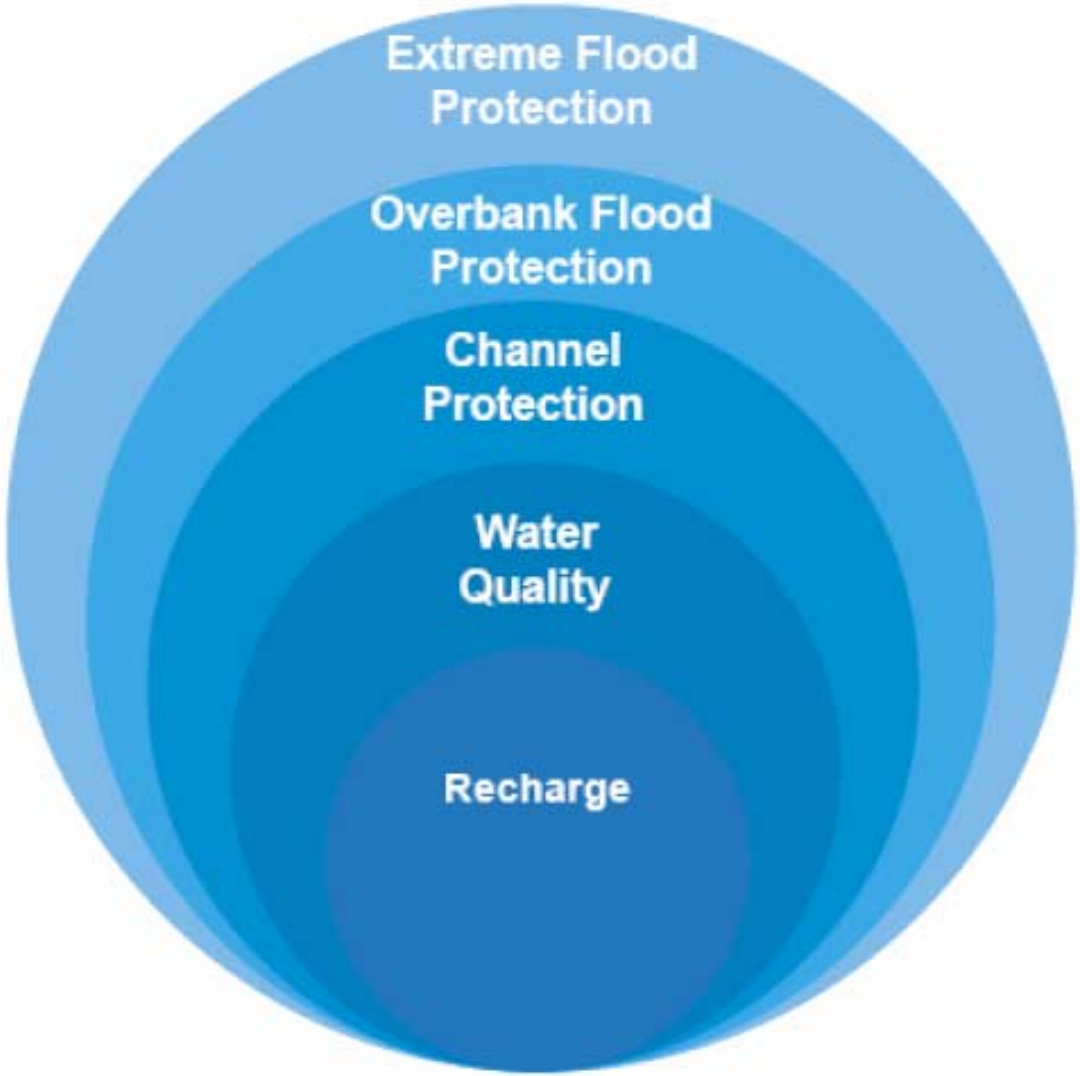
TAC has recommended revisiting the water QUANTITY criteria as well

- Reconcile various language found in E&S Control and Stormwater Management Laws, E&S Control and Stormwater Management Regulations, and approaches associated with new water quality criteria and methodology
- In particular, improve channel protection criteria in light of E&S Reg's MS-19
- Also consider adding recharge/runoff volume reduction requirements

Elements of Stormwater Quantity Control

- Groundwater recharge/runoff volume reduction
- Water quality protection
- Stream channel protection
- Overbank flood protection
- Extreme flood protection

These relate to each other in terms of “sizing criteria,” nested like a layer cake, with recharge as the thinnest layer and extreme storm control as the fattest layer

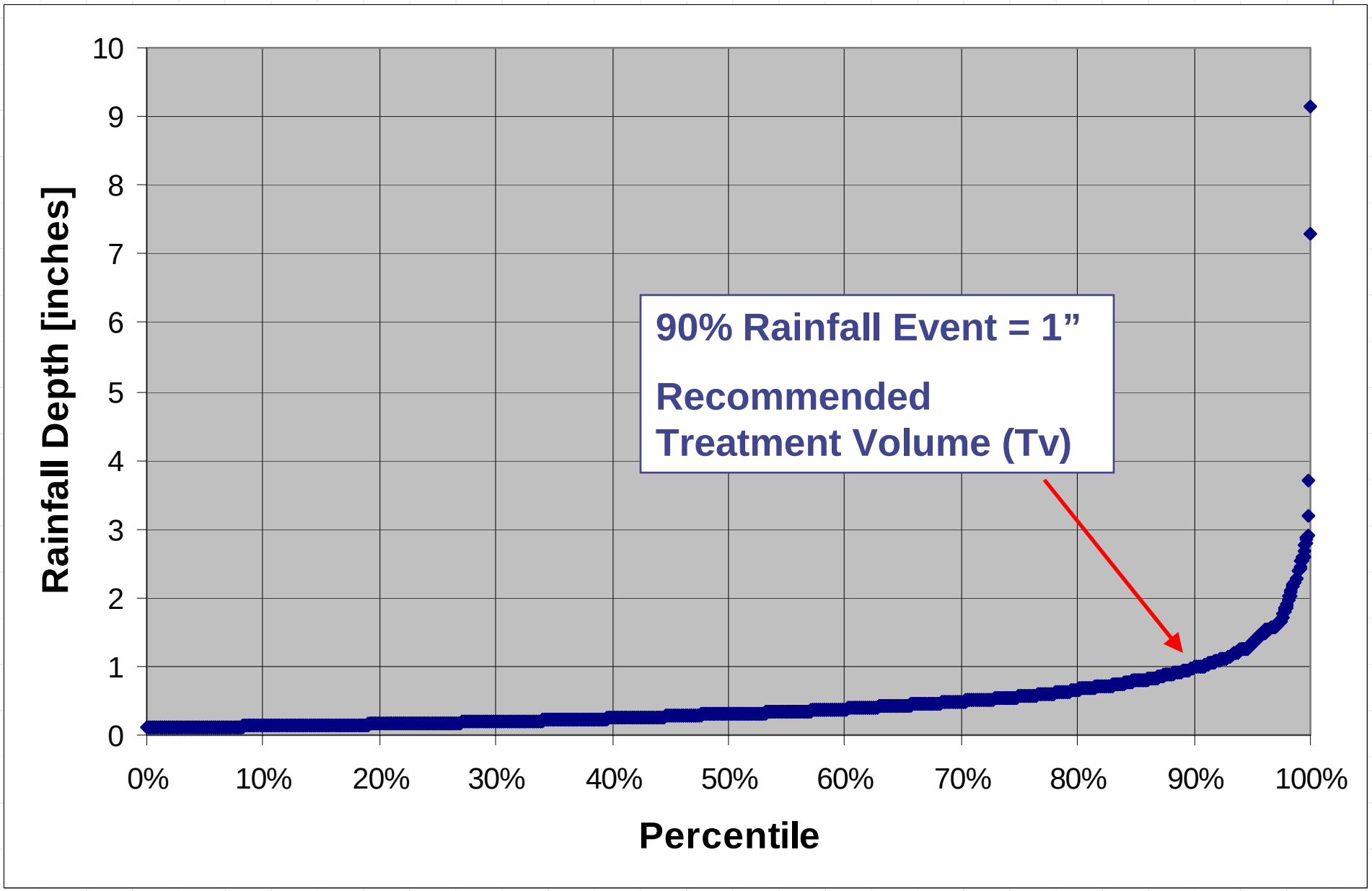

Extreme Flood Protection
Overbank Flood Protection
Channel Protection
Water Quality
Recharge

Current Requirements

- Recharge/Runoff Volume Reduction:
  - *Currently* NONE
  - Being addressed to some degree (without a "stated" requirement in the regulation) through the new runoff reduction computation methodology proposed for water quality compliance
  - A separate "stated" requirement may not be necessary

Current Requirements

- Water Quality Requirements:
  - *Currently* aimed at capturing and treating the *first flush* (first ½ - 1 inch of runoff)
  - The *proposed* regulations focus on treating the runoff from a 1-inch rainfall event (the 90th percentile storm)
    - The Treatment Volume for “Level 1” practices is the runoff from the 1-inch storm, aiming at median removal rates, based on the NPRPD
    - “Level 2” BMPs aim at 75th percentile removal rates; the treatment volume is a multiple (1.1, 1.2, or 1.5x) of the Level 1 practice


Rainfall Depth [inches]
10
9
8
7
6
5
4
3
2
1
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Percentile
90% Rainfall Event = 1”
Recommended
Treatment Volume (Tv)

Current Requirements

- Channel Protection
  - *Currently*, a performance requirement in E&S Law/Regs **(MS-19)** and SWM Law/Regs
    - Protect downstream properties and streams from sediment deposition, erosion, and other runoff-related damage
    - Protective measures minimize impacts on physical, chemical and biological integrity of receiving waters
    - Must assure an adequate *receiving channel* (NOT *outfall*)
  - Generally requires detention of the post-development 2-year/24-hour storm and releasing it at the *pre-development* 2-year/24-hour storm rate

Current Requirements

- Channel Protection (cont.)
  - It has been *suggested* to focus on detaining the 1-year/24-hour storm and releasing it over a 24-your period
    - This is done in numerous other states
  - Some stormwater experts believe this storm may result in making BMPs larger than necessary to adequately protect stream channels
  - ***This is an important issue to resolve***

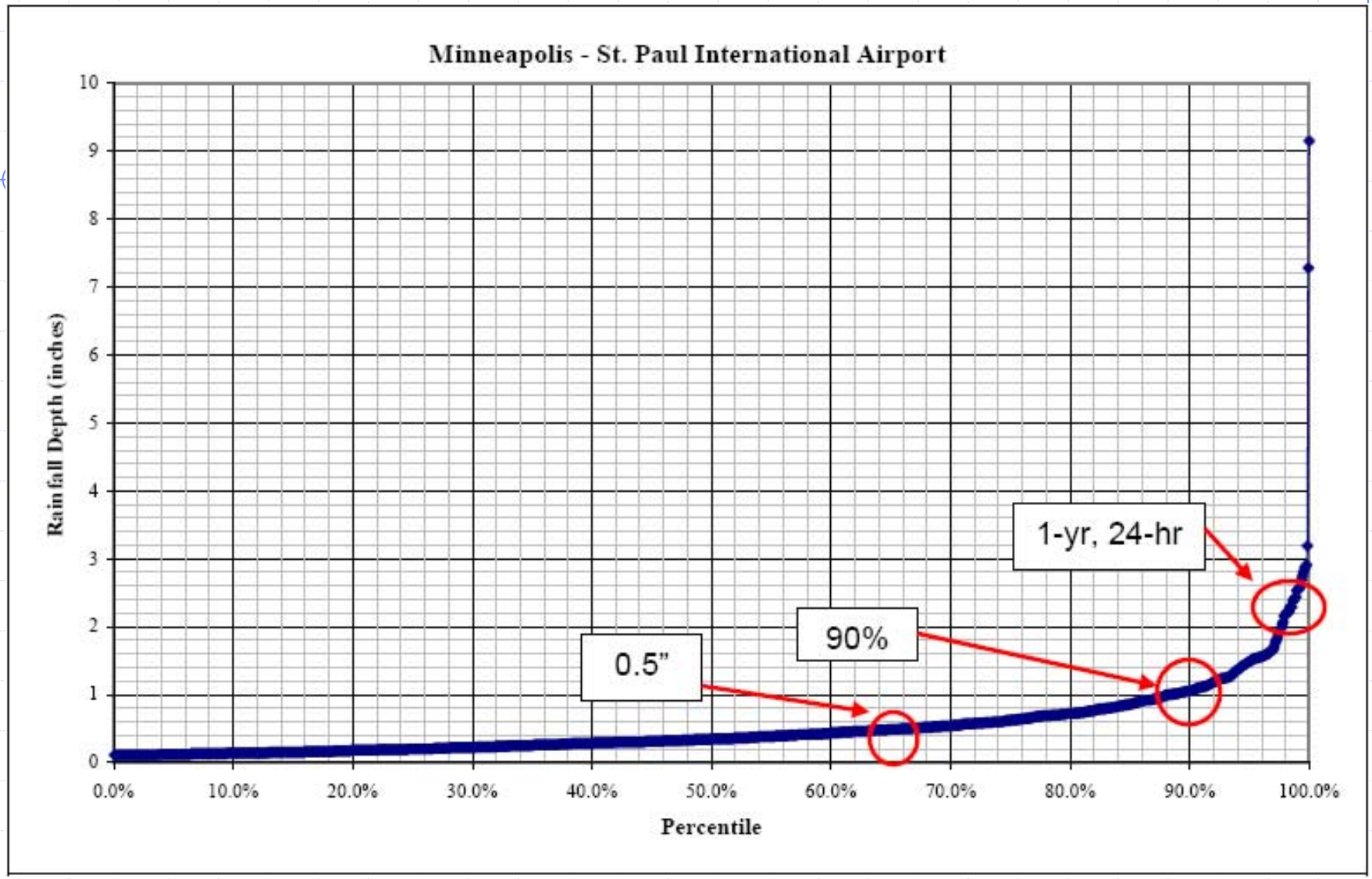


Figure 4.3: Rainfall Frequency Spectrum for Minneapolis-St. Paul, MN (1971-2000) with Several Noteworthy Rainfall Events Identified

Current Requirements

- Channel Protection (cont.)
  - The aim is to move this requirement into the SWM regulations, then refer to it in the E&S regulations
  - Collectively, there are a LOT of words used in the two laws and two regulations to address this issue; we need to filter this into language that:
    - Is generally consistent with the key principles
    - Is Reasonably easy to understand
    - Avoids math “games”
    - Provides accountability regarding compliance
    - Achieves adequate protection of downstream properties and resources
    - Integrates well with the runoff reduction/water quality protection methodology

Current Requirements

- Overbank Flood Control
  - *Currently* require control of the post-development 10-year/24-hour storm back to the *pre-development* 10-year/24-hour release rate
  - DCR does not expect to change this criterion

Current Requirements

- Extreme Flood Protection
  - This is generally addressed by separate federal/local Flood Plain Regulations/Ordinances
  - BMPs must be designed to safely bypass the post-development 100-year/24-hour storm in a manner that protects the structural integrity of the practice (e.g., emergency spillways, etc.)
  - DCR does not expect to change this criterion

Goals of Work Group

- Recommending what to do in the SWM Regulations about recharge/runoff reduction
- Recommending what to do in the SWM Regulations about channel protection criteria
- If possible, recommending how to best account for the effect of distributed runoff reduction practices on runoff hydrographs
  - This could affect the ultimate sizing of detention facilities aimed at channel protection

Handouts

- More detailed version of this presentation
- Specific channel protection language from Laws/Regs
- Sample rainfall frequency curves for Alexandria, VA (Reagan Airport) and Minneapolis, MN
- Draft preliminary discussion of methods to account for the effects of distributed runoff reduction practices on runoff hydrographs (from CWP staff)
- Paper on a Milwaukee, WI proposed solution for the hydrograph issue
- Excerpt from a Draft CWP document recommending criteria pertaining to Channel Protection

Conclusion

- QUESTIONS?